

Remarks and Arguments

The Applicants **amend** claims 1, 11, and 21.

The Applicants **cancel** claims 5, 8, 14, 23, 26, and 32.

The Applicants **withdraw** claims 9, 10, 20, 30, and 31.

The Applicants **add** new claims 33–38.

The remaining claims are unchanged from the original.

The remarks herein refer to the claims as amended. The Applicants respond to each of the remarks in the May 2, 2005, Office Action as follows:

Carter and Otani should not be combined under § 103

The Examiner continues to reject Claims 1–4, 6–7, 11–13, 15–17, 21–25, and 27–29 under 35 U.S.C. 103(a) as being unpatentable over U.S. Publication No. 2001/0019132 (the “Carter ‘132 application”) in view of Japanese Publication No. 08-208380 (the Otani ‘380 application). The Examiner acknowledges that the Carter application fails to disclose the step of introducing a hydrogen ambient into the growth chamber, and, therefore, adds the Otani application to show that element.

The Applicants explained in the prior Response and Amendment that the Carter ‘132 application and the Otani ‘380 are incompatible for combining under § 103 because Carter shows a specific temperature differential in the growth chamber that Otani fails to accommodate. The Applicants do not contest that Carter’s temperature differential shows the single element of the Applicant’s claimed temperature differential. The Applicants are stating, however, that regardless of whether Carter shows the claimed temperature differential, Otani provides absolutely no disclosure showing that Otani’s apparatus could accommodate Carter’s difference in temperatures. In this regard, the Examiner’s overall combination of Otani and Carter is insufficient to deny patentability.

As explained in greater detail in the prior Response and Amendment, Otani (Drawing 1) shows a single work piece coil 8 as the heating element. The same coil surrounds the source and seed during sublimation. There is no suggestion in the Otani

drawing that the work piece coil could provide the temperature differential that Carter requires.

Because Otani simply does not include any teachings in regard to achieving Carter's required temperature differential, the Examiner cannot show any motivation sufficient to move one of skill in the art to combine Otani's overall disclosure with the Carter '132 application. Without the required motivation, the Examiner's combination of references should not defeat patentability of the claimed invention because Carter lacks the hydrogen ambient, and Otani is an incompatible reference to show the hydrogen.

Claim Amendments and New Claims

Even more significant for purposes of patentability are the Applicants' currently presented claim amendments and new claims. Independent claims 1, 11, and 21 now recite introducing an ambient gas consisting of hydrogen. New independent claim 33 recites introducing an ambient gas consisting of a hydrocarbon gas. None of the cited references isolates the ambient gas to a single type as claimed. By reciting the introduction of the ambient gas in the chamber with the "consisting of" claim format, the Applicants have purposefully shown that only the claimed hydrogen ambient gas is introduced to the growth chamber from the outside. This embodiment of the invention is supported in the original specification at Paragraph 27.

It is important for purposes of defeating the cited references to note that the Otani '380 publication shows an ambient of argon (Ref. 10) in addition to hydrogen (Ref. 12). The Maeda '094 publication uses argon, a silane, and a hydrocarbon (Maeda, Drawing 1) to establish the ambient. In fact, Maeda's entire disclosure is based on the concept of adding silicon and carbon to the ambient gas to moderate fluctuations in crystal growth (Maeda, Abstract). Similarly, the Barrett '955 patent uses only an argon ambient (Col. 4, Line 18). None of these patents can be combined with the Carter publication to show or suggest the claimed invention which adds only the claimed hydrogen ambient to the growth chamber.

As explained in the Applicant's specification at Paragraph 12, the claimed hydrogen ambient, in the absence of other gases such as argon, allows control and

selective tuning of the nitrogen content of the growing crystal. Accordingly, the addition of only the hydrogen ambient is an improvement over the Otani, Maeda, and Barrett disclosures.

Conclusion

The Applicants respectfully request that the Examiner reconsider all of the rejections noted in this Amendment and Response and issue a Notice of Allowance accordingly.

The Applicants do not consider any fee due for responding to the Final Rejection within the two-month period allowed for receiving an Advisory Action. Additionally, the number of new claims is equal to the number of canceled claims, so no additional claim fees are due either. If additional fees are required or if any credits are due, the Examiner is hereby authorized to charge or credit Deposit Account No. 50-0332 as appropriate.

Respectfully submitted,

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